

CLAIMS

What is claimed is:

1. A binary digits coding method, wherein the binary digits are corresponding to the sequence of pulse groups, and the binary digit "0" and "1" is corresponding to the two pulse groups with two special defined pulse frequencies respectively and have the same defined number of pulses, said defined number at least two.

2. A decoding method corresponding to the coding method as set forth in claim 1, wherein,

the sequence of pulse groups are divided according to the said defined number;

the duration time of pulse groups are measured; and

the pulse groups are corresponding to the binary digits "0" or "1" according to the different duration time of the pulse groups.

3. The decoding method as set forth in claim 2, wherein the said duration time of the pulse group is the total time of the period time of the all the pulses in the group,

or is the sum of the period time of part of specially defined pulses in the pulse group.

4. A digital signal transmission method for executing the digits coding as set forth in claim 1 and the decoding as set forth in claim 2, including the process of sending and transferring the binary signals from the transmission side to the reception side, wherein,

At the transmission side, the binary digits are expressed as a sequence of pulse groups; The digits "0" and "1" are expressed by the two pulse groups with two special pulse frequencies and with same defined number of pulses, the said pulse groups have the same defined number of pulses;

Sending the sequence of pulse groups to the medium;

At the reception side, the said sequence of pulse groups is received and divided according to the said defined number;

The said duration time of the pulse groups in the sequence of pulse groups are measured and, the duration time differences of the pulse groups are used to express the binary digits "0" and "1".

5. The digital signal transmission method as set forth in claim 4,

wherein the signals are transmitted within one or multiple sub-channels of the

whole bandwidth of the medium; and the said two special frequencies are located in a sub-channel.

6. The digital signal transmission method as set forth in claim 5,
wherein each of the said two special frequencies of the pulse groups is located at the each side of the central frequency of the sub-channel.

7. The digital signal transmission method as set forth in claim 4,
wherein a synchronous process is included before the normal digit transmission for synchronizing the data transmission and reception and correctly dividing the sequence of pulse groups into the said pulse groups.

8. The digital signal transmission method as set forth in claim 7, wherein the said synchronous process is as follows:

The mark number, a pre-selected multi bytes binary number, is sent from the transmission side repeatedly, and the signals are received at the signal reception side;

if the received number is not the same with the said mark number, one pulse is canceled before the next time in comparing the received number with the said mark number, until the same number is received.

9. A coding circuit for executing the coding method as set forth in claim 1, comprising:

a coding module used for convert the binary digits into a sequence of pulse groups in which the digits "0" and "1" are corresponding to the pulse groups consist of same said defined number of pulses and with two said special defined frequencies;the pulse groups consist of same defined number of pulses;the said defined number is at least 2.

10. The coding circuit as set forth in claim 9, wherein said coding module comprising:

a interface, for converting the transmitting digits into serial signals and sending the binary digits logical levels to the voltage level transfer circuit;

a voltage level transfer circuit, for transferring the binary logical levels into two special voltage levels;

a voltage/frequency converter, generating the pulses with said two special frequencies according to the input two said special voltage levels;

a binary counter, for counting the pulses generated by the voltage/frequency converter, and as the said defined number of pulses is counted it controls interface to

output the next digit bit.

11. A decoding circuit for executing the decoding method as set forth in claim 2 comprising:

a decoding module for dividing the said the sequence of pulse groups into the pulse groups according to the said defined number and for measuring the duration time of each pulse group and then converting the said duration time differences into binary digits "0" or "1".

12. The decoding circuit as set forth in claim 11, wherein said decoding module comprising:

a binary counter, for counting the pulses in the said sequence of pulse groups, as the said defined number of pulses is reached, it controls the pulse group duration time measurement unit to measure the pulse group duration time;

a pulse group duration time measurement unit, for measuring the duration time of the pulse groups and output "low" or "high" voltage levels according to the difference of the duration time of the pulse groups for expressing the binary digits "0" or "1";

a interface, for receiving the voltage outputs from the pulse group duration time measurement unit, and converting them as the binary logical voltage levels.

13. A digital signal transmission circuit for executing the method as set forth in claim 4, comprising:

medium for signal transfer;

a coding module at the transmission side, for converting the binary digits as a sequence of pulse groups, the binary digits "0" and "1" are corresponding to the pulse groups with two special pulse frequencies and with the same defined number of pulses, the pulse groups have the same defined pulses number and the said defined pulses number is at least two;

a band filter and amplifier module located at the reception side for the signal band filtering and amplifying;

a synchronous module, connected with the band filter and amplifier module, for synchronizing the signal transmission and reception, and dividing the said sequence of pulse groups into said pulse groups;

a decoding module, connected with the synchronous module for dividing the said sequence of the pulse groups into the pulse groups according to the said defined number

and, for measuring the duration time of each pulse group and then converting the said duration time differences into binary digits "0" or "1".

14. The digital signal transmission circuit as set forth in claim 13, wherein said coding module comprising:

- a interface, for converting the transmission signal into serial signal and sending the serial logical voltage level to the voltage level transfer circuit;

- a voltage level transfer circuit, for converting the serial logical voltage levels into two special voltage levels corresponding to the said two special frequencies;

- a voltage/frequency converter, for generating pulses with the said two special frequencies according to the input two special voltage levels and;

- a binary counter, for counting the pulses output from the voltage/frequency converter as the said defined number is reached it controls the interface to output another bit.

15. The digital signal transfer circuit as set forth in claim 13, wherein said filter and amplifier module comprising filters and amplifiers.

16. The digital signal transmission circuit as set forth in claim 13, wherein said synchronous module comprising:

- a pulse canceling circuit for each time canceling one pulse;

- a comparator, for comparing the number output from decoding module with a said pre-selected mark number, if it is not the same, it controls the pulse canceling circuit to cancel one pulse from the sequence of the pulse groups, whereas if it is the same, the pulse canceling circuit will not work.

17. The digital signal transmission circuit as set forth in claim 13, wherein said decoding module comprising:

- a binary counter, for counting the pulses in the said sequence of pulse groups; As the said defined number is reached, it controls the pulse group duration time measurement unit to measure the duration time of the pulse groups;

- a pulse group duration time measurement unit, for measuring the pulse group duration time and converting the pulse group duration time differences into binary digits "0" and "1".

18. The digital signal transmission circuit as set forth in claim 13, wherein said transmission medium is the telephone lines or the electrical cable.

19. The digital signal transmission circuit as set forth in claim 13, wherein said transmission medium is electromagnetic wave.